

CLAIMS

What is claimed is:

- 1 1. A communication system, comprising:
2 a receiving unit; and
3 a transmitting unit operatively coupled to the receiving unit via a first channel,
4 the transmitting unit being configurable to transmit a first data stream to the receiving
5 unit in the first channel, the first data stream containing communications data and
6 control data, wherein the transmitting unit transmits the first data stream so that
7 communications data is transmitted in a grouping that complies with an
8 asynchronous protocol and the control data is transmitted within a segment of the
9 first data stream that is specified as unused for communications data according to
10 the asynchronous protocol.
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1 2. The communication system of claim 1 wherein the asynchronous protocol
2 conforms to an Ethernet standard and the grouping is an Ethernet compliant frame.
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1 3. The communication system of claim 1 wherein the segment includes an inter-
2 frame gap according to the asynchronous protocol.
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1 4. The communication system of claim 1 wherein the segment includes an idle
2 period according to the asynchronous protocol.

- 1 5. The communication system of claim 1 wherein the first channel is a free
2 space optical system.
- 1 6. The communication system of claim 1 further comprising a device coupled to
2 the receiving unit, wherein the device is configured to exchange communications
3 data with the receiving unit over a second channel in a second data stream
4 conforming to the asynchronous protocol.
- 1 7. The communication system of claim 6 wherein the receiving unit includes
2 a first interface unit coupled to the first channel;
3 a controller unit coupled to the first interface unit; and
4 a second interface unit coupled to the second channel.
- 1 8. The communication system of claim 7 wherein the controller unit includes:
2 a first processor to process control data; and
3 a second processor coupled to the first processor and the first interface unit,
4 wherein the second processor is capable of transferring control data between the
5 first interface unit and the first processor.
- 1 9. The communication system of claim 8 wherein the second processor is
2 further capable of transferring control data between the second interface unit and the
3 first processor.
- 1 10. The communication system of claim 8 wherein the second processor is
2 further capable of transferring communications data between the first and second
3 interface units.

1 11. The communication system of claim 7 wherein the first interface unit is
2 capable of transmitting an optical signal via free space.

1 12. The communication system of claim 11 wherein the second channel is a
2 wired channel.

1 13. A method for use in a communication system, the communication system
2 having a first channel to support transmission according to an asynchronous
3 protocol, the method comprising:

4 detecting a first segment in a first data stream to be transmitted in the first
5 channel, wherein the first segment is specified as unused for communications data
6 according to the asynchronous protocol; and

7 transmitting the first data stream in the first channel, wherein the first data
8 stream includes control data being transmitted within the first segment.

1 14. The method of claim 13 wherein the first data stream includes
2 communications data transmitted in a grouping of the first data stream that complies
3 with the asynchronous protocol.

1 15. The method of claim 14 wherein the asynchronous protocol conforms to an
2 Ethernet standard and the grouping is a frame according to the Ethernet standard.

1 16. The method of claim 15 wherein the first segment is an inter-frame gap
2 according to the asynchronous protocol.

1 17. The method of claim 15 wherein the first segment is an idle period.

1 19. The method of claim 18 wherein the asynchronous protocol conforms to an
2 Ethernet standard, the second grouping is a frame according to the Ethernet
3 standard and the second segment is an inter-frame gap according to the Ethernet
4 standard.

1 20. The method of claim 18 wherein the asynchronous protocol conforms to an
2 Ethernet standard, the second grouping is a frame and the second segment is an
3 idle period according to the Ethernet standard.

21. An apparatus for use in a communication system, the communication system having a first channel to support transmission according to an asynchronous protocol, the method comprising:

means for detecting a first segment in a first data stream to be transmitted in the first channel, wherein the first segment is specified as unused for data according to the asynchronous protocol; and

7 means for transmitting the first data stream in the first channel, wherein the
8 first data stream includes control data being transmitted within the first segment.

1 22. The apparatus of claim 21 wherein the first data stream includes
2 communications data transmitted in a grouping of the first data stream that complies
3 with the asynchronous protocol.

1 23. The apparatus of claim 22 wherein the asynchronous protocol conforms to an
2 Ethernet standard and the grouping is a frame according to the Ethernet standard.

1 24. The apparatus of claim 21 wherein the first segment is an inter-frame gap
2 according to the asynchronous protocol.

1 25. The apparatus of claim 21 wherein the first segment is an idle period
2 according to the asynchronous protocol.

1 26. The apparatus of claim 21 further comprising:
2 means for receiving a second data stream from the first channel, the second
3 data stream containing control data and communications data, the communications
4 data being in a first grouping that complies with the asynchronous protocol and the
5 control data being in a second segment that is specified as being unused for data
6 according to the asynchronous protocol;

7 means for extracting control data from the second segment;

8 means for extracting the communications data from the first grouping; and

9 means for transmitting in a second channel the extracted communications
10 data in a second grouping that complies with the asynchronous protocol.

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1 27. A communication system, comprising:

2 a first network;

3 a first transceiver coupled to the first network;

4 a second transceiver operatively coupled to the first transceiver via a first
5 channel, the second transceiver being configurable to transmit a first data stream to
6 the first transceiver in the first channel, the first data stream containing
7 communications data and control data, wherein the second transceiver transmits the
8 first data stream so that communications data is transmitted in a grouping of the first
9 data stream that complies with an asynchronous protocol and the control data is
10 transmitted within a segment of the first data stream that is specified as unused for
11 communication data according to the asynchronous protocol; and

12 a second network coupled to the second transceiver.

1 28. The communication system of claim 27 wherein the asynchronous protocol
2 conforms to an Ethernet standard and the grouping is an Ethernet compliant frame.

1 29. The communication system of claim 27 wherein the segment comprises an
2 inter-frame gap according to the asynchronous protocol.

1 30. The communication system of claim 27 wherein the segment comprises an
2 idle period according to the asynchronous protocol.

1 31. The communication system of claim 27 wherein the first channel is a free
2 space optical channel.

1 32. The communication system of claim 27 wherein the communications data
2 was received from the second network for transmission to the first network.

1 33. The communication system of claim 27 wherein the second transceiver
2 includes

- 3 a first interface unit coupled to the first channel;
- 4 a controller unit coupled to the first interface unit; and
- 5 a second interface unit coupled to the second network via a second channel.

1 34. The communication system of claim 33 wherein the controller unit includes:

- 2 a first processor to process control data; and
- 3 a second processor coupled to the first interface unit and the first processor,
- 4 wherein the second processor is capable of transferring control data between the
- 5 first interface unit and the first processor.

1 35. The communication system of claim 34 wherein the second processor is
2 further capable of transferring control data between the second interface unit and the
3 first processor.

1 36. The communication system of claim 34 wherein the second processor is
2 further capable of transferring communications data between the first and second
3 interface units.

1 37. The communication system of claim 33 wherein the first interface unit is
2 capable of transmitting an optical signal via free space.

1 38. The communication system of claim 37 wherein the second channel is a
2 wired channel.

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1 39. A transceiver for use in a communication system having a first channel and a
2 second channel, the first and second channels to respectively support transmission
3 according to first and second asynchronous protocols, the transceiver comprising:

4 a first interface unit coupled to the first channel;

5 a second interface unit coupled to the second channel; and

6 a controller unit coupled to the first interface unit, the controller unit to cause
7 the transceiver to transmit a first data stream through the first channel via the first
8 interface unit, the first data stream containing communications data and control data,
9 wherein the transceiver transmits the first data stream so that communications data
10 is transmitted in a grouping of the first data stream that complies with the first
11 asynchronous protocol and the control data is transmitted within a segment of the
12 first data stream that is specified as unused for communication data according to the
13 first asynchronous protocol.

1 40. The transceiver of claim 39 wherein the controller unit includes:

2 a first processor to process control data; and

3 a second processor coupled to the first processor and the first interface unit,
4 the first processor to transfer control data between the first interface unit and the first
5 processor.

1 41. The transceiver of claim 40 wherein the second processor is configurable to
2 transfer control data between the second interface unit and the first processor.

1 42. The transceiver of claim 40 wherein the second processor is further
2 configurable to transfer communications data between the first and second interface
3 units.

1 43. The transceiver of claim 39 wherein the first interface unit is capable of
2 transmitting an optical signal via free space.

1 44. The transceiver of claim 43 wherein the second channel is a wired channel.

1 45. The transceiver of claim 39 wherein the first data stream includes
2 communications data transmitted in a grouping of the first data stream that complies
3 with the first asynchronous protocol.

1 46. The transceiver of claim 45 wherein the first asynchronous protocol conforms
2 to an Ethernet standard and the grouping is a frame according to an Ethernet
3 standard.

1 47. The transceiver of claim 45 wherein the segment is an inter-frame gap
2 according to the first asynchronous protocol.

1 48. The transceiver of claim 45 wherein the segment is an idle period according
2 to the first asynchronous protocol.

1 49. The transceiver of claim 39 wherein the controller unit is configured to cause
2 the transceiver to transmit a second data stream through the second channel via the
3 second interface unit, the second data stream complying with the second
4 asynchronous protocol.

1 50. The transceiver of claim 49 wherein the second asynchronous protocol
2 conforms to an Ethernet standard.